Prostate Cancer Revealed by Recurrent Hematospermia in a Young Man: A Case Report and Literature Review

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Abstract

Prostate cancer in men under 50 is rare, and its presentation with hematospermia is exceptional. We report the case of a 45-year-old man with recurrent hematospermia and mild dysuria, diagnosed with poorly differentiated prostatic adenocarcinoma with metastases. This case highlights the importance of thorough clinical evaluation in persistent hematospermia, even in young men. We discuss the causes of hematospermia, the role of digital rectal examination in early diagnosis, and the unique characteristics of prostate cancer in young patients. A comprehensive review of similar cases, diagnostic challenges, therapeutic strategies, and future perspectives is also presented.

Keywords: *Prostate cancer, hematospermia, young men, digital rectal examination, case report*

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1. Introduction

Prostate cancer is the most common cancer in men worldwide, predominantly affecting those over 50. However, approximately 10% of cases occur in younger men, often with more aggressive features and a less favorable prognosis [1, 2]. Hematospermia, the presence of blood in semen, is rarely associated with prostate cancer but can indicate serious underlying conditions when persistent or accompanied by other symptoms [3]. This case report emphasizes the importance of considering prostate cancer in the differential diagnosis of hematospermia, even in young men without obvious risk factors. We also explore the clinical, diagnostic, and therapeutic challenges associated with early-onset prostate cancer, providing a comprehensive review of the literature.

2. Case Report

Patient Presentation

A 45-year-old man, Mr. S.Z., with no significant medical history, presented with recurrent hematospermia and mild dysuria. There was no family history of prostate cancer or other urological malignancies among first-degree relatives. The patient reported no recent trauma, urological procedures, or intense sexual activity. He denied any history of sexually transmitted infections or systemic symptoms such as fever or weight loss.

Clinical Examination

- **Digital rectal examination (DRE):** Revealed a hard, irregular, and enlarged prostate with palpable nodules. The prostate was fixed to surrounding structures, suggesting local invasion.
- **General examination:** No palpable lymphadenopathy, hepatosplenomegaly, or other abnormalities.
- **Neurological examination:** Normal, with no signs of spinal cord compression or neurological deficits.

Diagnostic Workup

1. **Laboratory Tests:**
    - **Cytobacteriological urine test:** No evidence of urinary infection or hematuria.
    - **Coagulation profile:** Normal, ruling out bleeding disorders.
    - **Prostate-specific antigen (PSA):** Elevated at 144 ng/ml (normal range: 0–4 ng/ml), strongly suggestive of prostate cancer.
2. **Imaging Studies:**
    - **Urinary tract ultrasound:** Prostate volume estimated at 80 g (normal range: 20–30 g) with a post-void residual volume of 160 ml, indicating bladder outlet obstruction.
    - **Prostate MRI:** Expansive prostatic process with invasion of the seminal vesicles and left internal iliac lymph nodes, classified as PIRADS 5 (highly suspicious for clinically significant prostate cancer).
3. **Histopathological Examination:**
    - **Transurethral resection of the prostate (TURP):** Performed to relieve obstructive symptoms and obtain tissue for histopathology.
    - **Histopathology:** Revealed poorly differentiated adenocarcinoma with a Gleason score of 9 (5 + 4), involving more than 80% of the chips. A ductal component, associated with aggressive behavior, was estimated at 15%.
4. **Extension Workup:**
    - **Thoraco-abdomino-pelvic CT scan:** Heterogeneous left external iliac lymph node, suggestive of metastatic involvement.
    - **Bone scintigraphy:** Increased uptake at the L1 vertebral body, indicating bone metastasis.
    - **Spinal MRI:** Confirmed a suspicious lesion at the L1 vertebral body, consistent with metastatic disease.

Treatment and Follow-Up

- **Hormone therapy:** The patient was started on combined androgen deprivation therapy (LHRH analog and abiraterone acetate) as first-line treatment for metastatic prostate cancer.
- **Radiation therapy:** Considered for palliative management of bone metastases and locally advanced disease.
- **Follow-up:** At 6 months, the patient showed a partial response to treatment, with a reduction in PSA levels (from 144 ng/ml to 12 ng/ml) and improvement in symptoms.

Family Screening

Given the patient’s young age and aggressive tumor, early screening was recommended for first-degree relatives, including PSA testing and urological consultation. Genetic counseling was also suggested to investigate potential hereditary mutations (e.g., BRCA1/2, HOXB13).

3. Discussion

3.1 Causes of Hematospermia

Hematospermia is often benign but can indicate serious conditions. Common causes include [4, 5]:

- **Infections and inflammations:** Prostatitis, urethritis, epididymitis, or sexually transmitted infections.
- **Trauma:** Urological procedures, intense sexual activity, or perineal injury.
- **Tumoral pathologies:** Prostate cancer, seminal vesicle tumors, or bladder cancer.
- **Vascular malformations:** Prostatic varices or arteriovenous malformations.
- **Other causes:** Urogenital tuberculosis, prostatic calculi, or systemic bleeding disorders.

In this case, hematospermia was the presenting symptom of aggressive prostate cancer, underscoring the need for thorough evaluation in persistent or recurrent cases [6].

3.2 Prostate Cancer in Young Men

Prostate cancer in men under 50 accounts for less than 10% of diagnosed cases. However, these cases are often associated with more aggressive features [7, 8]:

- **High Gleason score:** Tumors in young patients tend to be poorly differentiated, with higher Gleason scores (≥8).
- **Advanced stage at diagnosis:** Young patients are often diagnosed at a more advanced stage, with locoregional or distant metastases.
- **Genetic predisposition:** Genetic mutations, such as BRCA1/2, HOXB13, or those associated with Lynch syndrome, are more common in young patients with prostate cancer.

3.3 Role of Digital Rectal Examination

Digital rectal examination (DRE) remains a key tool in the diagnosis of prostate cancer. Although it has limited sensitivity for detecting localized cancers, it can identify abnormalities such as induration, asymmetry, or increased prostate volume [9]. In this case, DRE revealed a hard, enlarged prostate, prompting further investigations.

3.4 Management of Metastatic Prostate Cancer

The management of metastatic prostate cancer relies on a multidisciplinary approach, including [10, 11]:

- **Hormone therapy:** First-line treatment for metastatic prostate cancer, involving androgen deprivation therapy (LHRH analogs) and androgen receptor inhibitors (abiraterone acetate).
- **Radiation therapy:** Used to treat bone metastases or locally advanced lesions, providing palliative relief and improving quality of life.
- **Chemotherapy:** In cases of hormone resistance, chemotherapy (docetaxel) may be offered to prolong survival.
- **Targeted therapies:** PARP inhibitors (olaparib, rucaparib) are indicated for patients with BRCA1/2 mutations, offering a personalized treatment approach.

3.5 Genetic Forms of Prostate Cancer

Approximately 10% of prostate cancers are linked to genetic predisposition. The most frequently implicated mutations include [12, 13]:

- **BRCA1/2:** These mutations increase the risk of aggressive prostate cancer and are associated with a poorer prognosis.
- **HOXB13:** This mutation is specifically associated with hereditary prostate cancer, particularly in young patients.
- **Lynch syndrome:** Mutations in DNA repair genes (MLH1, MSH2, MSH6, PMS2) increase the risk of prostate and other cancers.

3.6 Similar Cases of Prostate Cancer Discovered Following Hematospermia

Hematospermia as a presenting symptom of prostate cancer is rare, but several cases have been reported in the literature. These cases highlight the importance of considering prostate cancer in the differential diagnosis of hematospermia, especially in young men or those with additional risk factors [14, 15].

3.7 Limitations of the Study

This case report has some limitations:

- It is based on a single case, which limits the generalizability of the findings.
- The follow-up period is relatively short, and long-term outcomes are not yet available.
- Genetic testing results for the patient and his family are pending, which could provide additional insights into the etiology of the disease.

3.8 Future Perspectives

Further research is needed to better understand the unique characteristics of prostate cancer in young men, including:

- The role of genetic mutations in early-onset prostate cancer.
- Strategies for early detection and screening in high-risk populations.
- The development of targeted therapies for aggressive forms of the disease.

4. Conclusion

Prostate cancer in young men is rare but often aggressive. Hematospermia, although usually benign, can be a presenting symptom of a serious condition, such as prostate cancer. A thorough clinical evaluation, including digital rectal examination and paraclinical investigations, is essential for early diagnosis and appropriate management. This case illustrates the importance of not overlooking urological symptoms in young men, even in the absence of family history or obvious risk factors. Early screening should be recommended for the patient's first-degree relatives to identify potential genetic predisposition and enable preventive or curative measures.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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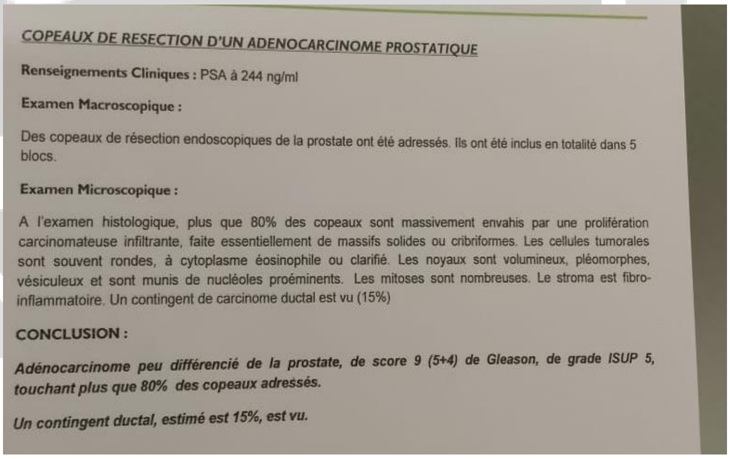
Figures (if available)

- **Figure 1** : Expansive process of the prostate with invasion of the seminal vesicles and left internal iliac lymph nodes, classified as PIRADS 5.
- **Figure 2** : Result of the histopathological examination of the prostate resection chips revealing a prostatic adenocarcinoma with a Gleason score of 9 (5 + 4).
- **Figure 3** : Bone scintigraphy revealing increased uptake at the level of L1.
- **Figure 4** : Thoraco-abdomino-pelvic CT scan revealing a heterogeneous left external iliac lymph node.



COPEAUX DE RESECTION D'UN ADENOCARCINOME PROSTATIQUE

Renseignements Cliniques : PSA à 244 ng/ml

Examen Macroscopique :

Des copeaux de résection endoscopiques de la prostate ont été adressés. Ils ont été inclus en totalité dans 5 blocs.

Examen Microscopique :

A l'examen histologique, plus que 80% des copeaux sont massivement envahis par une prolifération carcinomateuse infiltrante, faite essentiellement de massifs solides ou cribriformes. Les cellules tumorales sont souvent rondes, à cytoplasme éosinophile ou clarifié. Les noyaux sont volumineux, pléomorphes, vésiculeux et sont munis de nucléoles proéminents. Les mitoses sont nombreuses. Le stroma est fibro-inflammatoire. Un contingent de carcinome ductal est vu (15%)

CONCLUSION :

Adénocarcinome peu différencié de la prostate, de score 9 (5+4) de Gleason, de grade ISUP 5, touchant plus que 80% des copeaux adressés.

Un contingent ductal, estimé est 15%, est vu.

Figure 1 : Prostate MRI

Figure 2 : Result of the histopathological

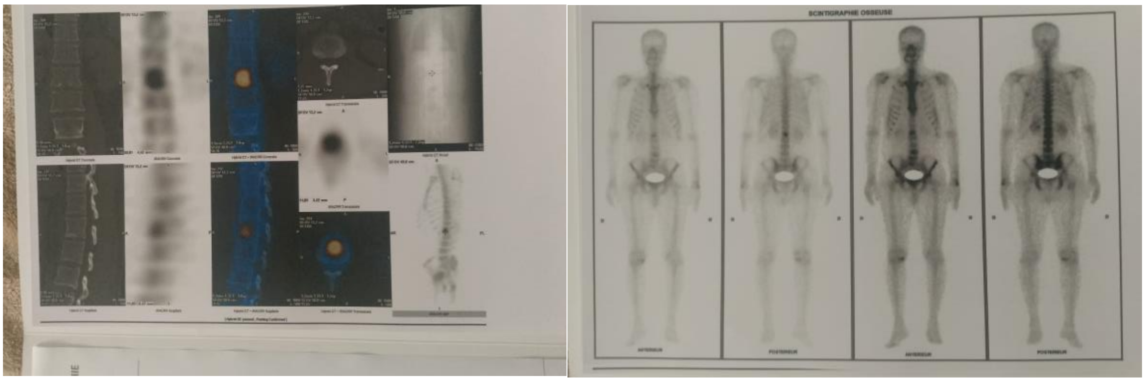


Figure 3 : Bone scintigraphy revealing increased uptake at the level of L1.

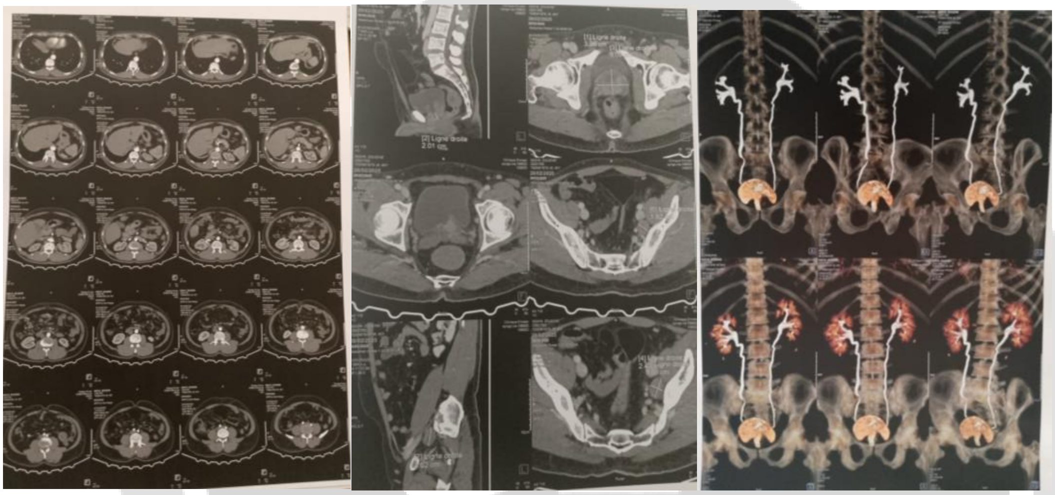


Figure 4 : Thoraco-abdomino-pelvic CT scan revealing a heterogeneous left external iliac lymph node.